

Claims

1. Communication system (100)

- comprising a fixed-network communication network (101),
- comprising a mobile radio communication network (102),
- comprising a mobile radio network/fixed network interface computer (116) which is connected to the fixed-network communication network (101) and to the mobile radio communication network (102) for mapping a data stream between the fixed-network communication network (101) and the mobile radio communication network (102),
- comprising a superpeer host computer (120) which is connected to the mobile radio network/fixed network interface computer (116), and
- comprising a peer-to-peer message filter (117), disposed in the mobile radio communication network (101), which is configured such that peer-to-peer messages (119) supplied from the mobile radio communication network (101) to the peer-to-peer message filter (117) are detected and can be supplied to the superpeer host computer (120).

2. Communication system (100) according to claim 1, in which the fixed-network communication network (101) is based on Internet protocols.

3. Communication system (100) according to claim 1 or claim 2, in which the superpeer host computer (120) is disposed in the mobile radio communication network (102).

4. Communication system (100) according to any one of claims 1 to 3, in which the mobile radio communication network (102) is based

on a third- or subsequent-generation mobile radio system .

5. Communication system (100) according to claim 4,  
in which the mobile radio communication network (102) is based  
on one of the following mobile radio communication networks:

- Universal Mobile Telecommunications System (UMTS),
- Future Public Land Mobile Telephone System (FPLMTS).

6. Communication system (100) according to any one of claims 1  
to 3,  
in which the mobile radio communication network (102) is based  
on a mobile radio communication network in accordance with  
Groupe Speciale Mobile (GSM).

7. Communication system (100) according to claim 5,

- in which the mobile radio communication network (102) is  
based on the Universal Mobile Telecommunications System  
(UMTS), and
- in which the mobile radio network/fixed network interface  
computer (116) is a gateway GPRS support node computer.

8. Communication system (100) according to any one of claims 1  
to 7,  
comprising an installation mechanism which is configured such  
that a peer-to-peer service is installed in the superpeer  
computer (120) if this service is requested sufficiently  
frequently.

9. Computer comprising a peer-to-peer message filter (117)  
which is configured such that peer-to-peer messages (119)  
supplied from the mobile radio communication network (102) to  
the computer comprising the peer-to-peer message filter (117)

are detected and can be supplied to a superpeer computer (120).

10. Method for processing a peer-to-peer message,

- in which a mobile radio peer-to-peer message (118) is detected by a computer comprising a peer-to-peer message filter (116, 117) disposed in a mobile radio communication network (101),
- in which the mobile radio peer-to-peer message (118) is transmitted to a superpeer computer (120) connected to a mobile radio network/fixed network interface computer (116), and
- in which the mobile radio peer-to-peer message (119) is processed by the superpeer computer (120).

[...] computing capacity of the central processing unit (CPU), the available bandwidth of the communication interface or communication link to which the peer-to-peer computer is connected and the memory space available in the peer-to-peer computer.

It is also known that peer-to-peer services can be provided for mobile terminals in a mobile radio network by an interface computer mapping data streams from the mobile radio network into a connected fixed network, for example the Internet, and vice versa.

According to the prior art, the superpeer computers are available only in the fixed-network communication network. Communication in the fixed-network communication network is normally effected in accordance with the Internet Protocol (IP) and the Transport Control Protocol (TCP) or else the User Datagram Protocol (UDP) as well as in accordance with the peer-to-peer protocol assigned to the peer-to-peer service being used in each case.

If, within the framework of packet-switched communication with a mobile radio terminal, a peer-to-peer service is to be used by the mobile radio terminal, then the performance of a peer-to-peer service used by said mobile radio terminal depends essentially on the point at which a superpeer computer associated with the respective service is disposed within the fixed-network communication network. In peer-to-peer-service data traffic which has been generated by a mobile radio terminal, the data packets of the data traffic must, for example in the case of GPRS (General Packet Radio Service), always be routed via the GGSN computer (gateway GPRS support node computer) until they enter the IP-based fixed-network communication network, and, in the most unfavorable case,

return again into a mobile radio communication network.

For this procedure, considerable resources are needed, both in terms of the computing power of the computers involved and in terms of the available bandwidth of the fixed-network communication network and of the mobile radio communication network, which may possibly result in the impairment of other data traffic or of other [...]

## Claims

### 1. Communication system (100)

- comprising a fixed-network communication network (101),
- comprising a mobile radio communication network (102),
- comprising a mobile radio network/fixed network interface computer (116) which is connected to the fixed-network communication network (101) and to the mobile radio communication network (102) for mapping a data stream between the fixed-network communication network (101) and the mobile radio communication network (102),
- comprising a superpeer host computer (120) which is connected to the mobile radio network/fixed network interface computer (116), and
- comprising a peer-to-peer message filter (117), disposed in the mobile radio communication network (101), which is configured such that peer-to-peer messages (119) supplied from the mobile radio communication network (101) to the peer-to-peer message filter (117) are detected and can be supplied to the superpeer host computer (120).

2. Communication system (100) according to claim 1, in which the fixed-network communication network (101) is designed such that it uses Internet protocols.

3. Communication system (100) according to claim 1 or claim 2, in which the superpeer host computer (120) is disposed in the mobile radio communication network (102).

4. Communication system (100) according to any one of claims 1 to 3, in which the mobile radio communication network (102) is designed such that it uses a third- or subsequent-generation mobile radio system.

5. Communication system (100) according to claim 4, in which the mobile radio communication network (102) is designed such that it uses one of the following mobile radio communication networks:

- Universal Mobile Telecommunications System (UMTS),
- Future Public Land Mobile Telephone System (FPLMTS).

6. Communication system (100) according to any one of claims 1 to 3,

in which the mobile radio communication network (102) is designed such that it is a mobile radio communication network in accordance with Groupe Speciale Mobile (GSM).

7. Communication system (100) according to claim 5,

- in which the mobile radio communication network (102) is based on the Universal Mobile Telecommunications System (UMTS), and
- in which the mobile radio network/fixed network interface computer (116) is a gateway GPRS support node computer.

8. Communication system (100) according to any one of claims 1 to 7,

comprising an installation mechanism which is configured such that a peer-to-peer service is installed in the superpeer computer (120) if the frequency of demand for the peer-to-peer service reaches at least a threshold value.

9. Computer comprising a peer-to-peer message filter (117) for use in a communication system according to any one of the preceding claims, which is configured such that peer-to-peer messages (119) supplied from the mobile radio communication network (102) to the computer comprising the peer-to-peer message filter (117) are detected and can be supplied to a superpeer computer (120).

10. Method for processing a peer-to-peer message in a communication system or in a computer comprising a peer-to-peer message filter according to any one of the preceding claims,

- in which a mobile radio peer-to-peer message (118) is detected by a computer comprising a peer-to-peer message filter (116, 117) disposed in a mobile radio communication network (101),
- in which the mobile radio peer-to-peer message (118) is transmitted to a superpeer computer (120) connected to a mobile radio network/fixed network interface computer (116), and
- in which the mobile radio peer-to-peer message (119) is processed by the superpeer computer (120).